---

1. Question Details   SCalcET7 12.1.003.MI. [2287022]

Use the given points to answer the following questions.

$$A(-3, 0, -1), \quad B(2, 2, -9), \quad C(1, 1, 7)$$

Which of the points is closest to the *yz*-plane?

○ A

○ B

○ C


Which point lies in the *xz*-plane?

○ A

○ B

○ C

Describe the surface in $\mathbb{R}^3$ represented by the equation $x + y = 3$.

○ This is the set $\{(x, 3 - x, z)|x \in \mathbb{R}, z \in \mathbb{R}\}$ which is a horizontal plane that intersects the xz-plane in the line $y = 3 - x, z = 0$.

○ This is the set $\{(x, 3 - x, z)|x \in \mathbb{R}, z \in \mathbb{R}\}$ which is a vertical plane that intersects the xz-plane in the line $y = 3 - x, z = 0$.

○ This is the set $\{(x, y, 3 - x - y)|x \in \mathbb{R}, y \in \mathbb{R}\}$ which is a vertical plane that intersects the xy-plane in the line $y = 3 - x, z = 0$.
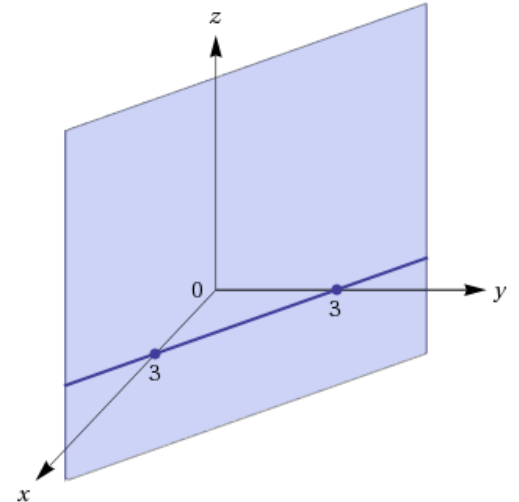
○ This is the set $\{(x, 3 - x, z)|x \in \mathbb{R}, z \in \mathbb{R}\}$ which is a horizontal plane that intersects the xy-plane in the line $y = 3 - x, z = 0$.

○ This is the set $\{(x, 3 - x, z)|x \in \mathbb{R}, z \in \mathbb{R}\}$ which is a vertical plane that intersects the xy-plane in the line $y = 3 - x, z = 0$.

Sketch the surface.

○

○

○

○
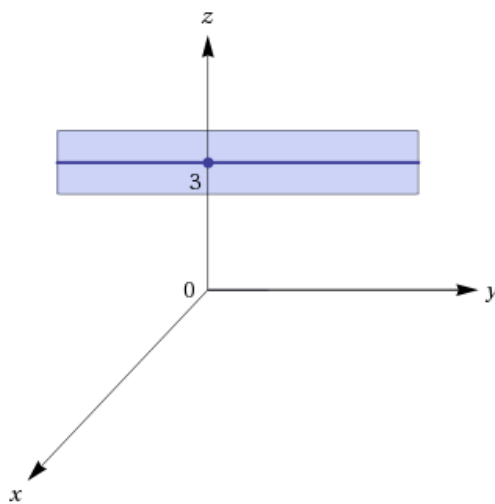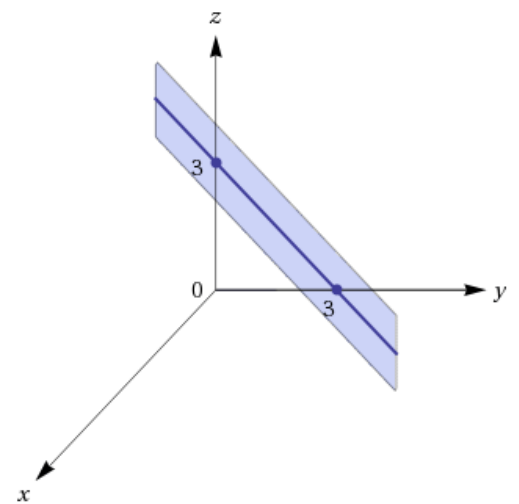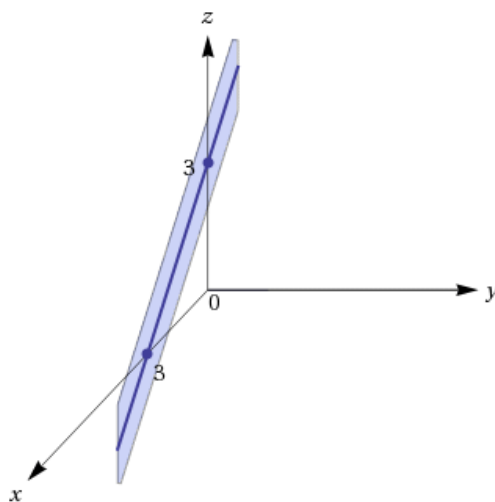
(a) What does the equation $x = 6$ represent in $\mathbb{R}^2$?

  ◯ a circle

  ◯ a plane

  ◯ a line

  ◯ a point

What does it represent in $\mathbb{R}^3$?

  ◯ a plane

  ◯ a line

  ◯ a circle

  ◯ a point

(b) What does the equation $y = 3$ represent in $\mathbb{R}^3$?

  ◯ a point

  ◯ a line

  ◯ a plane

  ◯ a circle

What does $z = 8$ represent?

  ◯ a plane

  ◯ a point

  ◯ a line

  ◯ a circle

What does the pair of equations $y = 3$, $z = 8$ represent? In other words, describe the set of points (x, y, z) such that $y = 3$ and $z = 8$.

  ◯ a circle

  ◯ a plane

  ◯ a point

  ◯ a line

Find the lengths of the sides of the triangle *PQR*.

$P(6, -1, 4),\quad Q(4, 1, 3),\quad R(4, -5, 0)$

$|PQ|$ = [   ]

$|QR|$ = [   ]

$|RP|$ = [   ]

Is it a right triangle?

○ Yes

○ No

Is it an isosceles triangle?

○ Yes

○ No

Determine whether the points lie on a straight line.

(a) $A(2, 4, 1),\quad B(3, 6, -1),\quad C(1, 3, 2)$

   ○ Yes, they do lie on a straight line.

   ○ No, they do not.

(b) $D(0, -5, 3),\quad E(1, -2, 2),\quad F(3, 4, 0)$

   ○ Yes, they do lie on a straight line.

   ○ No, they do not.

Find the distance from $(2, -6, 9)$ to each of the following.

    (a) the xy-plane

    (b) the yz-plane

    (c) the xz-plane

    (d) the x-axis

    (e) the y-axis

    (f) the z-axis

Find an equation of the sphere with center $(2, -10, 3)$ and radius 5.

Use an equation to describe its intersection with each of the coordinate planes. (If the sphere does not intersect with the plane, enter DNE.)

intersection with xy-plane

intersection with xz-plane

intersection with yz-plane

Find an equation of the sphere that passes through the point $(6, 5, -5)$ and has center $(5, 8, 5)$.

Find an equation of the sphere that passes through the origin and whose center is $(4, 3, 1)$.

10.

Question Details SCalcET7 12.1.017. [1760749]

Write the equation of the sphere in standard form.

$$2x^2 + 2y^2 + 2z^2 = 4x - 16z + 1$$

Find its center and radius.

center (x, y, z) = $\left(\ \rule{0pt}{1em}\hspace{8em}\ \right)$

radius

11.

Question Details SCalcET7 12.1.020.MI. [2208256]

Find an equation of a sphere if one of its diameters has endpoints $(2, 2, 4)$ and $(6, 6, 8)$.

12.

Question Details SCalcET7 12.1.021. [1835731]

Find equations of the spheres with center $(3, -5, 6)$ that touch the following planes.

   (a)   *xy*-plane

   (b)   *yz*-plane

   (c)   *xz*-plane

13.

Question Details SCalcET7 12.1.022. [1836066]

Find an equation of the largest sphere with center $(8, 4, 9)$ that is contained in the first octant.

Write an inequality to describe the region.

The solid cylinder that lies on or below the plane $z = 3$ and on or above the disk in the xy-plane with center the origin and radius 4

○ $x^2 + y^2 \leq 4$, $0 \leq z \leq 3$

○ $x^2 + y^2 \leq 16$, $0 \leq z \leq 3$

○ $x^2 + y^2 + z^2 \leq 3$, $0 \leq z \leq 4$

○ $x^2 + y^2 + z^2 \leq 16$, $0 \leq z \leq 3$

○ none of these

Write an inequality to describe the region.

The region consisting of all points between (but not on) the spheres of radius r and R centered at the origin, where $r < R$

○ $R^2 < x^2 + y^2 + z^2 < r^2$

○ $r^2 < x^2 + y^2 + z^2 < R^2$

○ $r^2 < \sqrt{x^2 + y^2 + z^2} < R^2$

○ $r^2 \leq x^2 + y^2 + z^2 \leq R^2$

○ none of these

Find an equation of the sphere with points P such that the distance from P to $A(-2, 6, 2)$ is twice the distance from P to $B(5, 2, -2)$.

Find its center and radius.

center (x, y, z) = (   )

radius

Assignment Details